02-25-00

PATENT APPLICATION TRANSMITTAL LETTER
(Large Entity)

Docket No.
INTL-0270-US (P7593)

TO THE ASSISTANT COMMISSIONER FOR PATENTS

Transmitted herewith for filing under 35 U.S.C. 111 and 37 C.F.R. 1.53 is the patent application of:

JEFFREY L. HUCKINS

For: **PROVIDING CONTENT DESCRIPTION AND CONNECTION INFORMATION IN DIGITAL BROADCAST NETWORKS**

Enclosed are:

- ☒ Certificate of Mailing with Express Mail Mailing Label No. **EL515090108US**
- ☒ **Five (5)** sheets of drawings.
- ☐ A certified copy of a application.
- ☒ Declaration ☒ Signed. ☐ Unsigned.
- ☒ Power of Attorney
- ☐ Information Disclosure Statement
- ☐ Preliminary Amendment
- ☒ Other: **Recordation Form Cover Sheet; Assignment and check for $40.**

CLAIMS AS FILED

For	#Filed	#Allowed	#Extra		Rate	Fee
Total Claims	30	- 20 =	10	x	$18.00	$180.00
Indep. Claims	6	- 3 =	3	x	$78.00	$234.00
Multiple Dependent Claims (check if applicable) ☐						$0.00
					BASIC FEE	$690.00
					TOTAL FILING FEE	$1,104.00

- ☒ A check in the amount of **$1,104.00** to cover the filing fee is enclosed.
- ☒ The Commissioner is hereby authorized to charge and credit Deposit Account No. **20-1504** as described below. A duplicate copy of this sheet is enclosed.
  - ☐ Charge the amount of as filing fee.
  - ☒ Credit any overpayment.
  - ☒ Charge any additional filing fees required under 37 C.F.R. 1.16 and 1.17.
  - ☐ Charge the issue fee set in 37 C.F.R. 1.18 at the mailing of the Notice of Allowance, pursuant to 37 C.F.R. 1.311(b).

Dated: **February 24, 2000**

Signature

Timothy N. Trop, Reg. No. 28,994
Trop, Pruner & Hu, P.C.
8554 Katy Freeway, Suite 100
Houston, Texas 77024
Phone: (713) 468-8880
Fax: (713) 468-8883

cc:

INTL-0270-US
(P7593)

APPLICATION

FOR

UNITED STATES LETTERS PATENT

TITLE: PROVIDING CONTENT DESCRIPTION AND CONNECTION INFORMATION IN DIGITAL BROADCAST NETWORKS

INVENTORS: JEFFREY L. HUCKINS

Express Mail No.: EL515090108US

Date: February 24, 2000

PROVIDING CONTENT DESCRIPTION AND CONNECTION INFORMATION IN DIGITAL BROADCAST NETWORKS

Background

The invention relates to digital broadcast networks and to techniques for communicating broadcast information.

Digital broadcasting systems may provide high quality video and audio and ancillary data over one or more channels. The resolution possible with a digital system may be many times higher than that of conventional television. This resolution may be achieved, even with a large number of channels, by reducing the bit rate of the transferred data. Such bit rate reductions may be achieved by efficiently utilizing available channel capacity and by exploiting complex video and audio compression technology.

To achieve higher resolution with reasonable bandwidth requirements, the information passed through the data channel is maximized while minimizing the amount of data required to represent the video image sequence and its associated audio. Thus, the broadcast system may include source coding and compression which relates to the use of bit rate reduction methods such as data compression.

Since the source may include not only video and audio but additional so-called ancillary data, the ancillary data may be compressed as well. The ancillary data may include control data, conditional access control data, and data

associated with the program audio and video services, such as closed captioning. The ancillary data may also include independent program services.

Digital broadcast systems also include service multiplex and transport that refers to the division of the data stream into packets of information, techniques for identifying each packet, and methods of multiplexing the video data stream packets, audio data stream packets and ancillary data stream packets into a single data stream. Ideally, these systems work with a variety of video sources including terrestrial broadcasting, cable distribution, satellite distribution and existing recording media and computer interfaces for example. The MPEG-2 transport stream syntax is used for packetization and multiplexing of video, audio and data signals under existing standards.

A digital broadcasting system may also include an RF/transmission system which relates to the coding of channels and modulation. The channel coder adds information to a data bit stream which may be used at the receiver to recover the data even when the data may be affected by transmission errors.

Thus, digital broadcasting systems offer the possibility of higher resolution using existing protocols. Because of the use of compression, the number of available channels may be increased increasing the complexity of the overall broadcast system. Moreover, even with the use of

compression techniques, the available bandwidth may commonly be fully utilized necessitating the use of techniques to transition bandwidth requests to intervals when bandwidth is available.

As a result of such techniques, information may be utilized to reconstruct the transmitted information. This transmitted information may be associated with particular channels so that the user can select a channel for viewing at any given time. However, the broadcaster may be capable of providing the information on any one of a variety of channels. For example, cable or satellite operators have complete control over what goes on what channels. Thus, in a digital broadcast system, it is possible to dynamically assign channels to information based on bandwidth or other considerations. As a result, connection information may be provided in the broadcast stream which associates audio/video content with a given channel. In addition, content information may be provided which provides a description of content that is or will be provided over the broadcast system.

In some cases, it may be desirable to have information about the audio/visual content prior to the time that the actual content information becomes available. For example, the content information may be utilized to develop an electronic content guide (also known as an electronic programming guide). However, with existing broadcast

standards, an announcement stream is transmitted which provides both the information about the content and the information about how to connect to the content.

Thus, there is a continuing need for better ways to broadcast information in digital broadcast networks.

Brief Description of the Drawings

Fig. 1 is a block diagram of one embodiment of an information delivery system in accordance with the present invention;

Fig. 2 is a block diagram of a transport operator system, receiving system, and server according to one embodiment of the information delivery system of Fig. 1;

Fig. 3 is a schematic depiction in accordance with one embodiment of the present invention;

Fig. 4 is a flow chart showing software resident on the transport operator in accordance with one embodiment of the present invention; and

Fig. 5 is a flow chart showing software resident on a receiver in accordance with one embodiment of the present invention.

Detailed Description

Referring to Fig. 1, an information delivery system 10 according to one embodiment of the invention includes a content creator 12, a transport operator system 14, and a plurality of receivers 16. The receivers 16 may be located

at various receiving sites, including homes, offices, entertainment facilities, or other locations. The content creator 12 originates ancillary data and television content (or other types of content including audio and/or video data) to be transmitted by the transport operator system 14. Alternatively, the content creator 12 may create ancillary data, with television content provided by another source, to the transport operator system 14.

Ancillary data may include graphics (e.g., web pages, multimedia information, or other digital data files), presentation layouts, electronic content guides and synchronization information. The transport operator system 14 provides an enhanced content delivery infrastructure that may include terrestrial, cable, satellite, or other types of transmission facilities (either analog or digital). The audio/video content and ancillary data may be transmitted over a transport medium 22, which may be a terrestrial, cable, satellite, or other type of link, to the receivers 16. The receivers 16 may include televisions, set-top boxes, personal computers, or other types of systems adapted to receive audio/video content and associated ancillary data.

As used in this description, the term audio/video (A/V) content is intended to include any type of audio and/or video data that may be transmitted or distributed to one or more receiving sites for presentation to viewers

and/or listeners. As used here, A/V content may refer to content that may include both an audio and a video portion or one of an audio or video portion.

In MPEG-2 based systems such as ATSC (Advanced Television Systems Committee) or DVB (Digital Video Broadcasting), transport stream programs correspond to what is commonly thought of as TV channels. MPEG stands for Moving Picture Experts Group, and the MPEG-2 standard is described in ISO/IEC 13818-1 (MPEG-2 Systems), ISO/IEC 13818-2 (MPEG-2 Video) and ISO/IEC 13818-3 (MPEG-2 Audio), dated in 1994 and provided by the International Organization for Standardization (ISO) and the International Electrotechnical Commission (IEC). A description of ATSC may be found in "Guide to the Use of the ATSC Digital Television Standard," dated October 1995. DVB standards may be available from the web site {http://www.etsi.org}. A description of DVB may be found in "Digital Video Broadcasting (DVB); Specification for Service Information(SI) in DVB Systems" (ETS 300468, February 1998) available from the European Telecommunications Standards Institute (ETSI), Cedex, France.

These transport stream programs can contain audio, video, and data (e.g., ancillary information), with all of them tightly associated with that single transport stream program. When a user tunes to the transport stream

program, the receiving device knows the audio, video, and data that are associated because they are marked as being part of the same program. The ancillary data may also be provided separately from the audio/video content.

An announcement may be transmitted either separately from the audio/video content or in conjunction therewith. The announcement may provide information useful for understanding what information has been transmitted and for coordinating information transmitted at different times that relates to different subject matters. Thus, as used herein, the term "announcement" is merely intended to refer to information other than content that is provided over the broadcast system.

Thus, an announcement may include both connection information and content description information. The content description information is useful to obtain information about the substance of the information that has been transmitted in the content stream. Thus, content description information may be utilized for generating electronic content guides or other displays at the receiver. Connection information provides information about the transport that has been used to provide the information to the receiver. Depending on the service multiplex and transport that is chosen for the particular system, different information may be provided as connection information. For example, in a satellite system, the

connection information may constitute information about the satellite such as a satellite transponder identifier or a satellite identifier. In other systems, the connection information may amount to information corresponding to a channel number.

Thus, in one embodiment of the present invention, the audio/video content 24 may be received from a content creator 12 and transmitted by a transport operator over a service multiplex and transport 22 to a plurality of receivers 16. The transport operator 14 may also transmit, either with that content or separately therefrom, content description information 26 and connection information 28.

Referring to Fig. 2, the transport operator system 14 may include a receiving port 102 to receive audio/video content information from a content creator 12 over a link 24. Content description information 26 and the connection information 28 may be provided to a controller 106 in the transport operator system 14. The controller 106 may be run under control of a software routine 108 (referred to as a transport routine). The transport routine 108 may initially be stored in a storage medium 104 and loaded by the controller 106 for execution. The information 28 may also be temporarily stored in the storage medium 104.

The transport operator may receive content description information as indicated at block 26 as well as connection information as indicated at block 28. The content

description information, which may be in the form of meta-data, may be part of an announcement stream such as a data program guide (DPG). The content description provides information about the nature of the audio/video content that is also being transmitted. Thus, the transport system 14 may transmit a separate announcement which includes the content description information. In addition, the transport operator system 14 may provide a separate announcement which includes the connection information 28. The connection information identifies the broadcast network connections that carry one or more of the data components that comprise the content associated with a broadcast session. For example, that content may be an event or television program as two examples.

As a result, the content description information may be broadcast as a separate announcement well in advance of the actual connection information. In some embodiments of the present invention, by uncoupling these two components of signaling information, the content description may be transmitted before it is known precisely how the connection to the content will actually be implemented. Once the assignment of a connection has been determined, the connection information may be transmitted and linked to the previously transmitted content description. This enables dynamic management of the connection information in the broadcast network.

Thus, in some embodiments of the present invention, the content description may be utilized, for example to develop an electronic content guide. In addition, the content description may be transmitted with the actual audio/video content at a desirable time. In a time interval of high audio/video traffic, only the connection information may be transmitted, thereby shifting the network bandwidth usage (for the audio/video content) in a way which may be advantageous in some embodiments of the present invention.

The standard connection signaling mechanisms may be utilized in accordance with some embodiments of the present invention as currently defined, for example, in the ATSC and DVB Standards. For example, a service description framework may include the definition of a data services table (DST) that is carried in MPEG-2 private sections in accordance with applicable standards. According to the DVB standard, a similar mechanism may be used to associate distinct data components of content with a logical identifier that identifies a broadcast network connection.

The connection information associated with the logical identifier may be carried in the DST for example. The connection information may be delivered to the receivers 16, providing adequate information to allow a receiver to locate the connection information given a connection identifier. Thus, in one embodiment of the present

invention, a connection information decoder component decodes the identifier and links it to the desired information.

In one embodiment of the present invention, separate storage media 113 and 115 coupled to the controller 106 may be provided for storing separately the content description information 26 and the connection information 28. In some embodiments of the present invention, a storage for the connection information 28 may be all that is provided. Thus, the connection information may be accumulated for later transmission. In such case, a template or place holder for the connection information may be stored in the storage 115. The template may provide the necessary linking information to link the connection information to the content description information and/or the audio/video content.

In the receiving system 16, a receiver circuit 114 (e.g., a TV tuner card) is adapted to receive content over the transport medium 22 and a transceiver 116. The receiving circuit 114 may be associated with an A/V device driver routine 130 that forwards the received A/V content to application software adapted to process and present the A/V content in the receiving system. The link 20 may provide a connection to another data source such as the Internet.

Application routines, device drivers, and other routines or programs may be executable on a controller 120. Such routines or programs may be initially stored in a storage medium 118 and loaded by the controller 120 for execution.

Once the two announcement streams have both arrived at a receiver 16, the streams may be linked to one another. In addition, it may be desirable to link the content description to the identity, such as a television channel number, of a service carrying the content. It may also be desirable to link the content description to a logical connection identifier for each data component of the content, to whatever granularity is desired. As an example, an "item", "group" hierarchy model may be defined in which "items" identify the lowest granularity of data components. The items may be coalesced into "groups". In this example, the connection information may be provided at the group level, item level, or some combination of both. For instance, within any given group, a connection identifier value for "use single group connection" may be used by some of the group items while the remainder of the items specify connections of their own. While an example with two levels of granularity is described, those skilled in the art should appreciate that any given number of granularity levels may be implemented in this fashion.

In some cases it may not be necessary to provide a service identifier. If the content description is carried with the broadcast service, a service identifier is obviously unnecessary. If the content description is carried outside of the service, for example combined with content descriptions for all services in the form of a data program guide, the content description specifies the service identifier. In the case of satellite transmissions, a satellite transponder identifier may be specified as well as a satellite identifier in some embodiments.

The specification of a connection information format may define how to acquire the connection information from a well defined location in the transport stream. Referring to Figure 3, the transport stream 32 may be an MPEG-2 transport stream with a series of program identifiers (PIDs) 34 separated by other data 36. The PID 34a may include a content description. The PID 34c may provide connection information associated with at least part of the content description. Thus, it may be appreciated that the connection information may be provided at a later time, spaced upstream from the associated content description.

Once the content description is acquired from the transport stream, it may be used to point to a specific instance of later received connection information data. The content description and connection information may be

managed separately in order to provide the capability to send a content description to the receiver 16 well in advance of knowing (or needing to know) what the connection to the data components of the content are or will be carried on. Thus, the content description may provide an identifier at the group level that "connects" to the content information and an identifier at the item level that "connects" to corresponding information in the connection information.

For example, referring to Figure 3, the content description 38 may include a service_ID (0x0002) that may link, as indicated by the arrow A, to corresponding connection information 39 for that service (e.g. channel). The group and item level descriptions may include an item tap_ID (0x0000) that links, as indicated by the arrow B, to a tap_ID (0x00) indicated in the connection information and including an Internet protocol (IP) address to make the correction. See Request for Comments (RFC) ___ available at www.ietf.com. Thus, corresponding granularities in the content description and connection information may be linked.

Referring next to Figure 4, software 40 for transmitting dual announcements, stored on the storage 104 for example, may cause the controller 106 to develop a content description as indicated in block 42. The content description may be loaded with links to identifiers in the

connection information as indicated in block 44. The content description may then be transmitted as indicated in block 46. In some embodiments of the present invention, the content description may be transmitted separately from the audio/video content. In other embodiments, it may be transmitted together with that information.

When the connection information becomes available, the connection information may be developed with appropriate identifiers linking to the identifiers previously provided for the content description, as indicated in block 48. In some cases, a template or place holder that was developed at the same time as the controller developed the content description may be utilized to insert the connection information. Thus, the connection information may simply be snapped into a template that was created with the appropriate identifiers and stored in the storage 115, in one embodiment of the present invention. Thereafter, the connection information may be transmitted to the receiver 16 as indicated in block 50.

Referring to Figure 5, at the receiver, software 52, in accordance with one embodiment of the present invention, may cause the content description announcement to be received as indicated at block 54, for example prior to receipt of the content information announcement. The content description may be displayed as indicated at 56 to enable use of the information, for example in connection

with the electronic content guide. This allows the user to decide what the user wishes to see without requiring the user or the system to necessarily know how the service is actually going to be provided.

As indicated in diamond 58, the software checks for the receipt of the associated connection information. When the associated connection information is received, the content description may be linked to the connection information using the identifiers as indicated in Figure 3 and in block 60 of Figure 5. In one embodiment of the present invention, a connection may then be made through the connection information to the source. As a result, the associated content may be obtained as indicated in block 64.

While the present invention has been described with respect to a limited number of embodiments, those skilled in the art will appreciate numerous modifications and variations therefrom. It is intended that the appended claims cover all such modifications and variations as fall within the true spirit and scope of this present invention.

What is claimed is:

1. A method comprising:

transmitting content;

transmitting a first announcement including connection information for said content; and

transmitting a second announcement including a content description for said content.

2. The method of claim 1 including transmitting said first announcement after transmitting the second announcement.

3. The method of claim 2 including arranging said content description with at least two levels of granularity.

4. The method of claim 3 including linking each of said granularity levels to connection information for said granularity.

5. The method of claim 1 further including providing a service identifier with said second announcement to link with said first announcement.

6. The method of claim 5 including specifying the location of service in said connection information.

7. The method of claim 6 further including transmitting ancillary information with said content.

8. The method of claim 2 further including providing an identifier to link said first and second announcements.

9. The method of claim 1 wherein transmitting said connection information includes transmitting a data program guide.

10. An article comprising a medium for storing instructions that cause a processor-based system to:

transmit content;

transmit a first announcement including connection information for said content; and

transmit a second announcement including a content description for said content.

11. The article of claim 10 further storing instructions that cause a processor-based system to transmit said first announcement after transmitting said second announcement.

12. The article of claim 11 further storing instructions that cause a processor-based system to arrange

said content description with at least two levels of regularity.

13. The article of claim 11 further storing instructions that cause a processor-based system to provide an identifier to link said first and second announcements.

14. A method comprising:

receiving content;

receiving a first announcement including connection information for said content;

receiving a second announcement including a content description for said content; and

linking said first and second announcements to one another.

15. The method of claim 14 wherein receiving said second announcement includes receiving said second announcement after said first announcement.

16. The method of claim 15 including identifying at least two levels of granularity in said content description.

17. The method of claim 16 including linking each of said granularity levels to connection information for said granularity.

18. The method of claim 14 including identifying a service identifier with said second announcement to link to said first announcement.

19. The method of claim 18 including identifying the location of service in said connection information.

20. An article comprising a medium for storing instructions that cause a processor-based system to:

receive content;

receive a first announcement including connection information for said content;

receive a second announcement including a connection description for said content; and

link said first and second announcements to one another.

21. The article of claim 20 further storing instructions that cause a processor-based system to receive said second announcement after said first announcement.

22. The article of claim 21 further storing instructions that cause a processor-based system to identify at least two levels of granularity in said content description.

23. The article of claim 22 further storing instructions that cause a processor-based system to link each of said granularity levels to connection information for said granularity.

24. The article of claim 20 further storing instructions that cause a processor-based system to identify a service identifier with said second announcement to link to said first announcement.

25. The article of claim 24 further storing instructions that cause a processor-based system to identify the location of service in said connection information.

26. A processor-based system comprising:

a processor; and

a transmitter coupled to said processor to transmit a first and second announcement and video content, said first announcement including connection information

for said content and said second announcement including a content description for said content.

27. The system of claim 26 wherein said transmitter transmits an identifier that may be used to link said first and second announcements.

28. The system of claim 26 wherein said transmitter transmits said second announcement before said first announcement.

29. A processor-based system comprising:

a processor; and

a receiver coupled to said processor to link a first with a second announcement, said first announcement including connection information for video content and said second announcement including a content description for said content.

30. The system of claim 29 wherein said receiver links said first and second announcements.

PROVIDING CONTENT DESCRIPTION AND CONNECTION INFORMATION IN DIGITAL BROADCAST NETWORKS

Abstract of the Disclosure

A system enables connection information and content description information to be separately transmitted from a broadcaster to a receiver. Thus, the description of the content may be provided to a receiver prior to the time that the information needed to specify the connection to the service such as a channel is known. By uncoupling the content description and connection information, the assignment of connection information may be managed dynamically in the broadcast network.

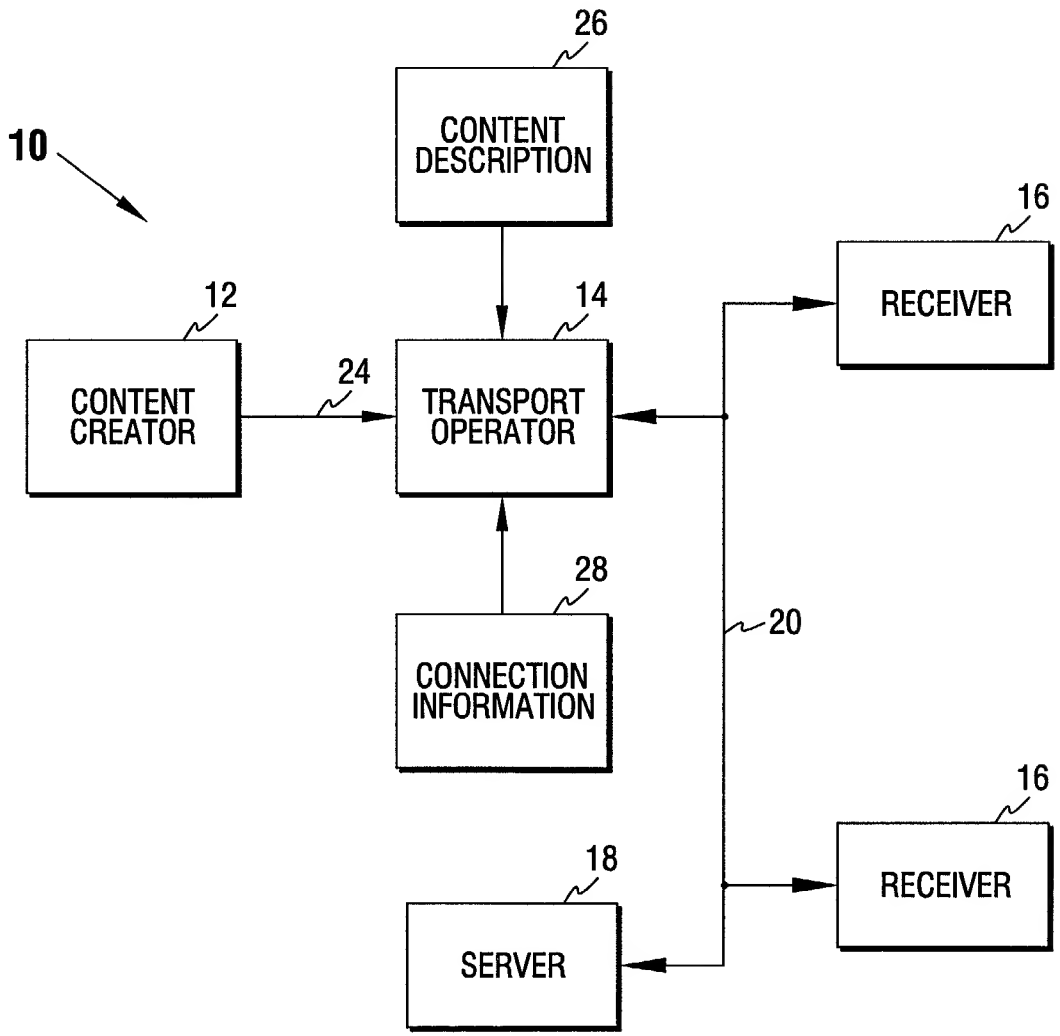
10
26
CONTENT DESCRIPTION
16
RECEIVER
12
14
CONTENT CREATOR
24
TRANSPORT OPERATOR
28
CONNECTION INFORMATION
20
16
RECEIVER
18
SERVER

FIG. 1

DO NOT DELETE

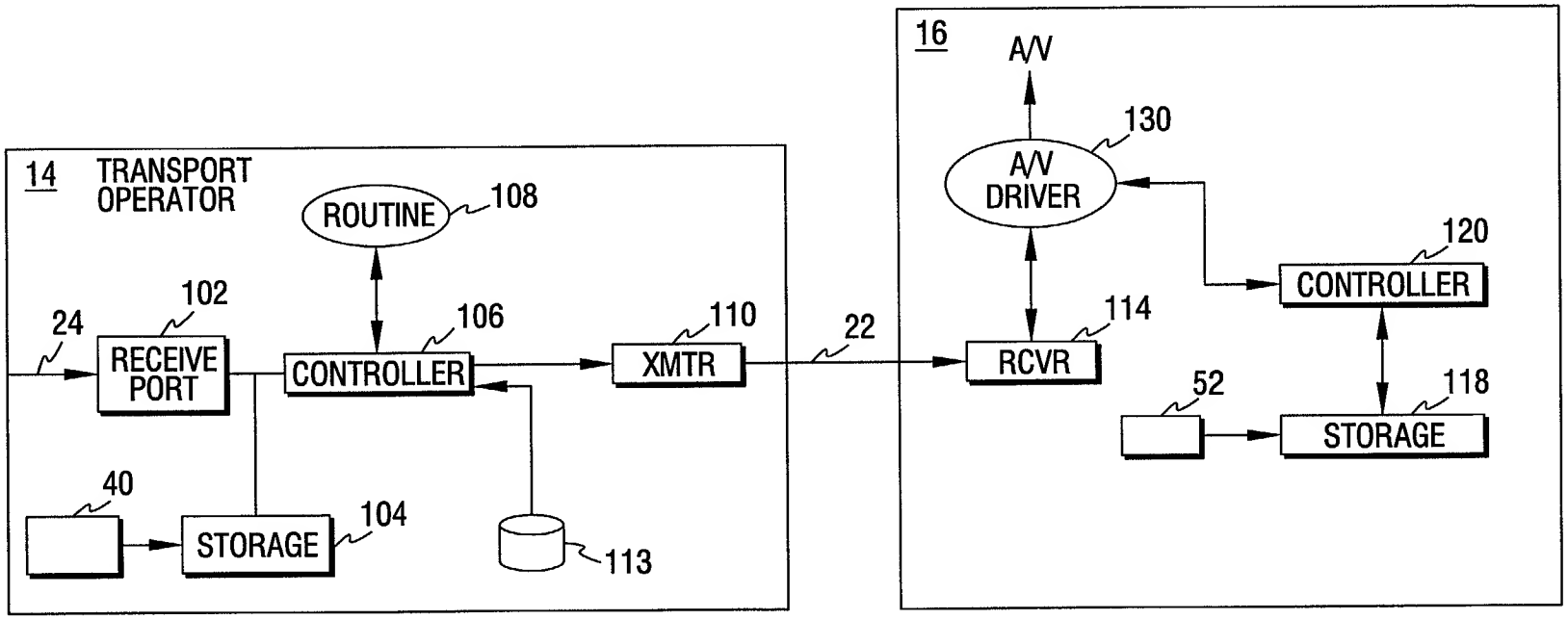

FIG. 2

DO NOT REMOVE

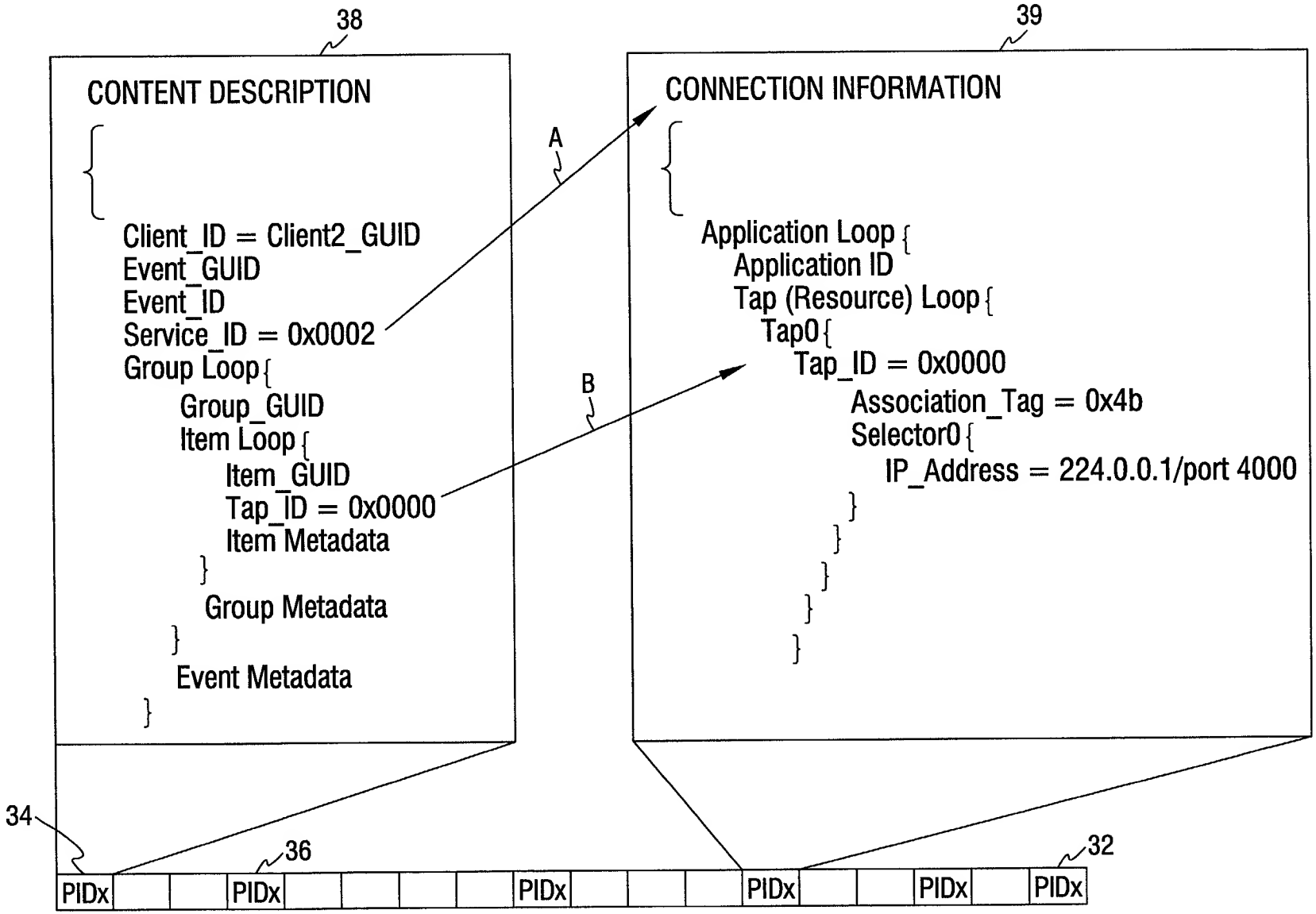

FIG. 3

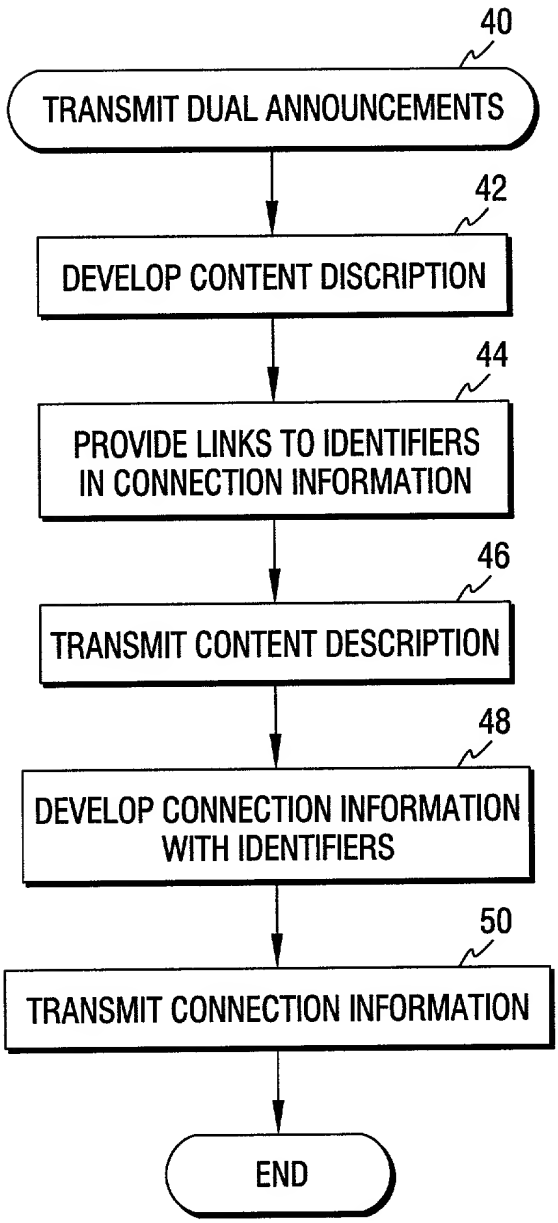
40
TRANSMIT DUAL ANNOUNCEMENTS
42
DEVELOP CONTENT DISCRIPTION
44
PROVIDE LINKS TO IDENTIFIERS IN CONNECTION INFORMATION
46
TRANSMIT CONTENT DESCRIPTION
48
DEVELOP CONNECTION INFORMATION WITH IDENTIFIERS
50
TRANSMIT CONNECTION INFORMATION
END

FIG. 4

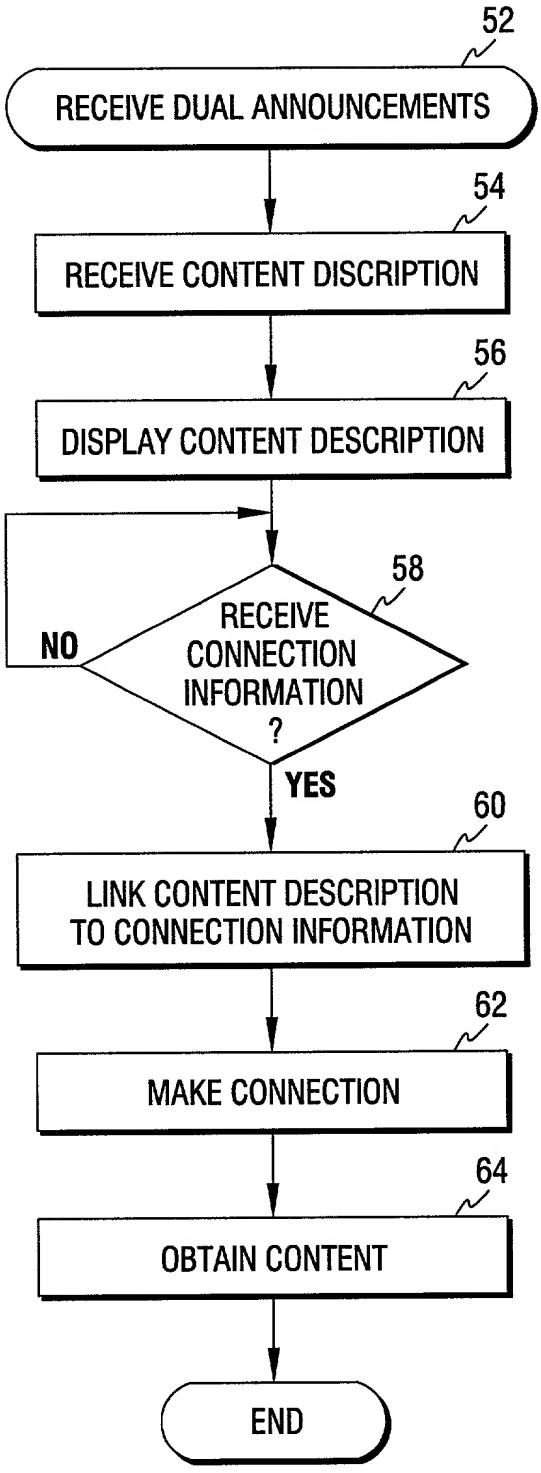
52
RECEIVE DUAL ANNOUNCEMENTS
54
RECEIVE CONTENT DISCRIPTION
56
DISPLAY CONTENT DESCRIPTION
58
RECEIVE CONNECTION INFORMATION ?
NO
YES
60
LINK CONTENT DESCRIPTION TO CONNECTION INFORMATION
62
MAKE CONNECTION
64
OBTAIN CONTENT
END

FIG. 5

Attorney's Docket No.: INTL-0270 -US (P7593) PATENT

DECLARATION AND POWER OF ATTORNEY FOR PATENT APPLICATION

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below, next to my name.

I believe I am the original, first, and sole inventor (if only one name is listed below) or an original, first, and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

PROVIDING CONTENT DESCRIPTION AND CONNECTION INFORMATION IN DIGITAL BROADCAST NETWORKS

the specification of which

X	is attached hereto.
	was filed on _____ as
	United States Application Number _____
	or PCT International Application Number _____
	and was amended on _____
	(if applicable)

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claim(s), as amended by any amendment referred to above. I do not know and do not believe that the claimed invention was ever known or used in the United States of America before my invention thereof, or patented or described in any printed publication in any country before my invention thereof or more than one year prior to this application, that the same was not in public use or on sale in the United States of America more than one year prior to this application, and that the invention has not been patented or made the subject of an inventor's certificate Issued before the date of this application in any country foreign to the United States of America on an application filed by me or my legal representatives or assigns more than twelve months (for a utility patent application) or six months (for a design patent application) prior to this application.

I acknowledge the duty to disclose all information known to me to be material to patentability as defined in Title 37, Code of Federal Regulations, Section 1.56.

I hereby claim foreign priority benefits under Title 35, United States Code, Section 119(a)-(d), of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

Prior Foreign Application(s):			Priority Claimed	
Number	(Country)	(Day/Month/Year Filed)	Yes	No
Number	(Country)	(Day/Month/Year Filed)	Yes	No
Number	(Country)	(Day/Month/Year Filed)	Yes	No

I hereby claim the benefit under title 35, United States Code, Section 119(e) of the United States provisional application(s) listed below:

(Application Number)	(Filing Date)
(Application Number)	(Filing Date)

I hereby claim the benefit under Title 35, United States Code, Section 120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, Section 112, I acknowledge the duty to disclose all information known to me to be material to patentability as defined in Title 37, Code of Federal regulations, Section 1.56 which became available between the filing date of the prior application and the national or PCT International filing date of this application:

(Application Number)	Filing Date	(Status-patented, pending, abandoned)
(Application Number)	Filing Date	(Status-patented, pending, abandoned)

I hereby appoint Timothy N. Trop, Reg. No. 28,994; Fred G. Pruner, Jr., Reg. No. 40,779 and Dan C. Hu, Reg. No. 40,025 my patent attorneys, of TROP, PRUNER & HU, P.C., with offices located at 8554 Katy Freeway, Ste. 100, Houston, TX 77024, telephone (713) 468-8880, and Joseph R. Bond, Reg. No. 36,458; Richard C. Calderwood, Reg. No. 35,468; Sean Fitzgerald, Reg. No. 32,027; David J. Kaplan, Reg. No. 41,105; Leo V. Novakoski, Reg. No. 37,198; Naomi Obinata, Reg. No. 39,320; Thomas C. Reynolds, Reg. No. 32,488; Steven P. Skabrat, Reg. No. 36,279; Howard A. Skaist, Reg. No. 36,008; Steven C. Stewart, Reg. No. 33,555; Raymond J. Werner, Reg. No. 34,752; and Charles K. Young, Reg. No. 39,425; my patent attorneys, of INTEL CORPORATION; with full power of substitution and revocation, to prosecute this application and to transact all business in the Patent and Trademark Office connected herewith.

Send correspondence to Timothy N. Trop, TROP, PRUNER & HU, P.C., 8554 Katy Freeway, Ste. 100, Houston, TX 77024 and direct telephone calls to Timothy N. Trop, (713) 468-8880.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Full Name of Sole/First Inventor: **JEFFREY L. HUCKINS**	
Inventor's Signature:	Date: 2/17/00
Residence: **CHANDLER, ARIZONA**	Citizenship: **U.S.**
Post Office Address: **652 W. HONEYSUCKLE DRIVE, CHANDLER, ARIZONA 85248**	

INTL-0270 -US (P7593)